EuroSun2018

12th International Conference on
Solar Energy for Buildings and Industry

September 10-13, 2018 | Rapperswil, Switzerland

In cooperation with:

SWISSOLAR 7th Swissolar Solar Heating Conference

SIGES Conference on the Simulation of Building-Integrated Energy Systems — 2nd SIGES Conference on the Simulation of Building-Integrated Energy Systems

SAC 2018 8th International Conference on Solar Air Conditioning

www.eurosun2018.org

Content

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https://cms2018.eurosun2018.org/program

Chairpersons‘ Messages

Welcome to EuroSun 2018 and the Swissolar Solar Heating Conference.

It is our great pleasure to welcome you to the International Solar Energy Society‘s EuroSun 2018 in Rapperswil, Switzerland.

This year’s conference takes place on the beautiful campus of the HSR University of Applied Science Rapperswil on Lake Zürich jointly hosted by HSR and Swissolar, the Swiss chapter of ISES.

The worldwide success of renewable energy technologies, and solar energy in particular, is remarkable, and it is what we all work for. In many cases solar technologies are already the most economical way to produce electricity or heat. But there is still a very long way to go to achieve our goal of a 100% renewable energy supply. Efficiencies in all sectors must improve and the costs of components and services must be reduced further. We need a shift to thinking in terms of systems and a better understanding of the interaction of the needs and the energy production in the electricity, heating/cooling, and mobility sectors.

In the last few years we have seen a growing competition between solar thermal technologies and solar electricity in the heating/cooling sector. It is not yet clear where that competition will lead us. Most certainly our future energy system will be more electrified than today. On the other hand it is important to recognize that energy systems will be more stable and more efficient if a variety of renewable technologies that complement each other are deployed. EuroSun focuses on both solar heating/cooling and electricity, especially as used by buildings and industry.

We are pleased that EuroSun 2018 is organized in cooperation with the Swissolar Solar Heating Conference, the 2nd SIGES Conference on the Simulation of Energy Systems for Buildings and the 8th International Conference on Solar Air Conditioning.

EuroSun 2018 offers a platform to discuss the latest technology and deployment developments with leading solar energy experts as well as policy makers and industry representatives. The conference program includes distinguished keynote speakers in plenary sessions, specialists meetings in breakout sessions and poster exhibitions as well as a number of technical and social side events where you will have the opportunity to network, meet old friends and make new ones.

For three days the campus of HSR in Rapperswil hosts the “who‘s who” in solar energy for buildings and industry.

We are happy to welcome you to EuroSun 2018.




Andreas Häberle, Director SPF
Institute for Solar Technology
David Stickelberger, Director Swissolar
Dave Renné, President ISES
Wolfgang Streicher, President ISES Europe

EuroSun2018
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Welcome to the 8th International Conference on Solar Air Conditioning!

This event continues to offer a platform for exchange and communication on the recurring question of the provision of cooling, resorting to the sunlight as renewable driver of the process.

Over the years the situation for solar cooling kept changing, lately with a strong tendency to the use of photovoltaic electricity as a result of the upcoming competitiveness of renewables in the electric sector.

Yet, in view of the global challenge of a comprehensive transition of the energy supply, solar thermal systems still offer the perspective for efficient integration of heating and cooling. The current drastic change of climatic phenomena and the optimization of the thermal design of buildings with concentration on minimization of the heating demand further add to the actuality of solar driven cooling.

Although our last conference lies only one year back, the number of contributions for the current SAC conference emphasizes the relevance of the topic and the necessity to offer a dedicated platform for the solar cooling community with profound discussions in the focal point of thermodynamic processes, material selection and practical application.

The EuroSun provides a perfect frame for the SAC conference, offering the opportunity to exchange with experts from other solar disciplines and view of the wider aspects of the use of solar energy in buildings and industry.

Christian Schweigler
Munich University of Applied Sciences
Chairperson SAC 2018

Welcome to SIGES – Conference on the Simulation of Building-Integrated Energy Systems

It is my pleasure to announce the second Conference on the Simulation of Building-Integrated Energy Systems SIGES. After a first execution in September 2016 at ZHAW Zurich University of Applied Sciences in Winterthur, we are excited tohold the follow-up conference in cooperation with EuroSun 2018 in Rapperswil.

Energy performance requirements, the demand for renewable energy and the tightening of energy regulations have strongly influenced the building sector. New products have evolved and a systems view has established itself. Thermal and electrical components interrelate and may take active or passive roles as producers, energy storage devices or consumers.

With progressive digitalization in the building sector, the energy topic has become even more relevant. The planning process is about to shift from a 2D paper-based approach to a complex process, based on a continuously changing multi-dimensional data structure. Building Information Modeling (BIM) has become a new methodology in which energy considerations play a major role. Physics-based predictive simulation has become increasingly important. It is inevitable to account for solar energy, be it as passive solar gains through the windows or active solar components on the rooftop or in the façade.

The conference on the Simulation of Building-Integrated Energy Systems SIGES offers an opportunity to exchange innovative ideas and present recent research results. It builds a bridge between the academic world and implementation of progressive energy systems. Furthermore, we have managed to join the International Conference on Solar Air Conditioning and the Swissolar Solar Heating Conference, all under the roof of EuroSun 2018. This exciting event provides an outstanding platform for networking, creativity and new experience.

Andreas Witzig
Scientific Chair of SIGES 2018 and
Member of the EuroSun 2018 Steering Committee

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Werner Weiss, AEE Intec, Austria
Stephen White, CSIRO, Australia
Stefan Wilbert, DLR, Germany

Monday, September 10, 2018

Workshop on: Breaking the Vicious Circle of Poverty in the Nepal Himalayas

Lessons learned during 20 years of bridging the gap between community development, applied research and investment

Date: Monday, September 10

Time: 15:00 - 17:00

Room: 5.002

In this workshop, Dr. Alex Zahnd will present some of the key lessons he learned since the mid 90's how contextualized technologies, educational tools and infrastructures developed according to the local communities' self-identified needs can break the chains of extreme poverty through a constructive cross-cultural dialogue and awaken educational and economic activities. He will also illustrate that access to improved energy services through tapping into the local renewable energy resources through contextualized renewable energy technologies, are at the heart of any long-term community development project and program.

He will highlight that a long-term and holistic perspective of all involved stakeholders, especially in the project partnership and in funding, is one of the most critical success factors of development projects and still deserves a wider recognition as a best practice.

This talk is aimed at engineers, members of health and development organizations and visionaries who are interested in approaches to make lasting changes through development projects, and also at charity organizations, donors and impact investors who want to assess the prospects of investing in specific development projects.

Welcome Reception

We welcome all participants to Rapperswil and invite you to the Welcome Reception on Monday, September 10 from 17:00 - 19:00 at the conference venue.

Join this initial get-together for social networking in a relaxed atmosphere and enjoy light refreshments at a beautiful location at Lake Zürich!

The Welcome Reception is sponsored by Viessmann.

Thank you!

VIESMANN

Young ISES

All students and young professionals are also welcome to join the Young ISES Welcome + Meet and Greet in Room 4.115, from 17:30 - 18:00.

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Tuesday, September 11, 2018

09:00 - 09:30 — **Opening**

AULA

Chair: Andreas Häberle, SPF Institute for Solar Technology

Welcome from HSR

Alex Simeon, Prorector HSR

Welcome from ISES

Eicke Weber, Vice President ISES

Welcome from ISES Europe

Wolfgang Streicher, President ISES Europe

Welcome from the Conference Chair

Andreas Häberle, SPF Institute for Solar Technology

09:30 - 10:10 — **Keynote Lectures**

AULA

Chair: Andreas Häberle, SPF Institute for Solar Technology

Talks in this session will be given in English with simultaneous translation into German.

09:30 Swiss Energy Strategy 2050

Gianni Operto, AEE Suisse

09:50 The Swiss Model of Innovation Support and Funding

Andreas Eckmanns, Swiss Federal Office of Energy

Gianni Operto

Mr. Gianni Operto, a leading utility and cleantech expert in Europe, is currently acting as the President of AEE SUISSE and as a non-executive board member at several start-up companies in Germany and Switzerland. The AEE SUISSE is the Industry Association of Renewables and Efficiency Industries in Switzerland.

Formerly, Mr. Operto was a private equity investor at Good Energies, a venture capitalist at Emerald Technology Ventures, the President and CEO of ewz, the Zurich municipal electric utility, and held various senior positions with worldwide responsibility at ABB Power Generation. Mr. Operto is a graduate (MS Mech. Eng.) of the ETH Zurich and has completed executive education at LBS.

Andreas Eckmanns

Andreas Eckmanns is responsible for the research domain „Buildings, Solar Thermal and Heat Storage" at the Swiss Federal Office of Energy. He has studied electrical engineering at the University for Applied Sciences of Basel. His professional background is in building integrated photovoltaics with focus on multifunctional applications such as heating, shadowing, noise protection, etc. Since 2001 he has been working for the Swiss Federal Office of Energy. In this capacity he is representing Switzerland in several committees of the International Energy Agency (IEA) and the European Union.

10:10 - 10:40 Coffee Break

10:40 - 11:30 Keynote Lectures

AULA

Chair: Andreas Häberle, SPF Institute for Solar Technology

Talks in this session will be given in English with simultaneous translation into German.

10:40 Trends in Solar Heating and Cooling

Daniel Mugnier, TECSOL

11:05 Trends in Solar Electricity

Andreas Bett, Fraunhofer ISE

Daniel Mugnier

Mr. Mugnier has professional experience in engineering solar thermal systems for large DHW applications and above all solar heating and cooling systems. Managing the innovation department of TECSOL - one of the French leading solar engineering companies - Daniel Mugnier is involved as well in numerous R&D projects on solar thermal on the national, European and international level. He is also author of several publications and presentations in international conferences on solar energy. He is currently Vice Chairman of the European Solar Thermal Technology Platform and Chair of the IEA Solar Heating and Cooling Programme.

Andreas Bett

Andreas W. Bett is director of the Fraunhofer Institute for Solar Energy Systems in Freiburg, Germany. His activities include the development of multi-junction solar cells which hold the absolute solar cell efficiency record of 46.1%. Recently a monolithic two-terminal triple-junction solar cell with an active Silicon as bottom cell achieved another record value of 33.3% under standard one sun testing condition. He received awards that include the 17th European Becquerel Prize for outstanding merits in photovoltaics, the Joseph von Fraunhofer Prize and the EARTO Prize in 2010, and in 2012 the prestigious German Environmental Prize of the DBU for the outstanding contribution to commercialise the CPV technology. He is co-founder of the companies NexWafe and Concentrix.

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11:30 - 12:30 Poster Session 1

Topics A, B, D: FOYER 1st floor building 1
Topics C, E, F: ROOMS 4.112 / 4.113

The poster numbers are based on topics:

A	Solar Buildings	D	Domestic Hot Water and Space Heating
B	Solar Assisted District Heating and Cooling	E	PV and PVT Systems for Buildings and Industry
C	Solar Heat for Industrial Processes	F	Thermal Storage

A-02 Evacuated Glazing with Silica Aerogel Spacers
Bastian Büttner, Bavarian Center for Applied Energy Research (ZAE Bayern)

A-03 Radiative Cooling to Cover Cooling Demands of an Earthbag Building in a Training Medical Cernter in Burkina Faso
Albert Castell, University of Lleida

A-05 Building Integrated Photovoltaic Systems – Energy Production Modelling in Urban Environment
Benjamin Govehovitch, University Lyon 1 / CETHIL

A-06 Architectural Integration of Photovoltaic Panels in Housing Building in San Miguel de Tucumán
Andrea Maria Gutierrez, Facultad de Arquitectura UNT

A-07 Energy Efficient & Sustainable Buildings in Qatar & Integration of Solar Assisted Air-Conditioning Technology – A Step Towards Grid Free Zero Carbon Living
Moazzam Khan, Qatar Environment & Energy Research Institute

A-08 Energy Performance Investigation of Energy-Plus Solar House Integrated Renewable Energy Systems
Min-Hwi Kim, Korea Institute of Energy Research

A-09 Modular Rooftop Building-Integrated Photovoltaic/Thermal Systems for Low-Rise Buildings in India
Olesia Kruglov, Concordia University

A-10 Thermal Monitoring on an Earthbag Building in Mediterranean Continental Climate
Ingrid Martorell, University of Lleida

A-11 Solar Buildings 'Lost in Translation'
Eduardo de Oliveira Fernandes, FEUP

A-12 Investigation of a Building Heating and Cooling Demand Using Passive Solar and Building Physics: A Comparative Study
Nafeez Rahman, Dalarna University

A-13 Optimizing Solar Thermal Systems for Netzero Buildings
Peter Skinner, E2G Solar LLC

A-14 Enabling Energy Access in Peri-Urban Areas with Compact Autonomous PV Kit
Ahmed Taleb, Al Akhawayn University

A-15 Solar Air and Heat Recovery Collector: A Performance Assessment
Christian Vachon, Vachon Sustainable Energy Inc.

A-16 Strategy to Use Solar Wall in Temperate Climate
Gerardo Vitale, University of the Republic

A-17 Early Design Stage Consideration of Building Form and BIPVT Energy Performance
Samson Yip, Concordia University

B-01 Design and Evaluation of a Parabolic Trough Photovolatic/Thermal Collector (CPV/T): A Three Dimensional Simulation Model
Wafa Ben Youssef, Laboratoire Optimisation de la Conception et Ingénierie de l' Environnement

B-02 Evaluation and Comparison of Different German Solar District Heating Systems with Seasonal Thermal Energy Storage
Natalie Gohl, ITW/TZS, University of Stuttgart
Presented by Dominik Bestenlehner, IGTE, University of Stuttgart

B-03 Research of the Possibility Study for Solar Seasonal Energy Storage System Based on BTES Theory
Qingtai Jiao, Solareast Corporation

B-04 Development of a Software System for Optimal Operation of Heating Networks with Central Solar Plant
Thomas Oppelt, Chemnitz University of Technology, Chair for Technical Thermodynamics

B-05 Opportunities for the Integration of Photovoltaic Panels and Solar Thermal Collectors in a Brazilian Hospital
Eduardo Antonio Pina, Universidad de Zaragoza

B-06 EnRSim – A Simplified Calculation Tool for Renewable District Heating Plants
Jean-François Robin, CEA Tech

B-07 Energy Performance Analysis of the Solar Assisted District Heating System Based on a Case Study
Hatice Sözer, Energy Institute

B-08 giga_TES: Giga-Scale Thermal Energy Storage for Renewable Districts
Wim van Helden, AEE INTEC

C-01 Techno-Economic Analysis of 1MWe Solar Power Plant Using a Combined Rankine Cycle in Izmir, Turkey
Biboum Alain Christian, Solar Energy Institute

C-02 A Control Strategy for a Solar Linear Fresnel Collector Driving a Desalination Plant
Mohamed Alhaj, Hamad Bin Khalifa University

C-03 Performance Analysis of Solar Powered Supercritical Organic Rankine Cycle Driven Reverse Osmosis
Eydhah Almatrafi, University of South Florida

C-04 Participative Development of a Sustainable Vanilla Pod Dryer for Small Scale Vanilla Producers in the Huasteca Potosina, Mexico
Clemens Brauer, TH Köln

C-06 Optimization of Solar Heat Integration in a Grape Juice Company
Alicia Crespo, Fraunhofer Chile Research - Center for Solar Energy Technologies

C-07 Geolocalization of Solar Heat Potential for Industrial Processes in Spain
Miguel Frasquet, University of Seville

C-08 Solar Desalination by Combination with Concentrated Solar Power: Exergy Cost Analysis
Roberto Leiva, UTFSM. Depto. Mecánica

C-09 Experimental and Numerical Analysis of Sun-Heat ElectricHybrid Tomato Dryer
Aye Naing, Mandalay Technological University

C-10 Feasibility Analysis of a Concentrated Solar Thermal System for Industrial Heating Processes
Sehar Shakir, National University of Sciences & Technology (NUST)

C-11 Design of an Indigenous Solar Based Polygeneration System for Dairy Plant
Anju Singh, National Institute of Solar Energy

C-12 Analysis of the Operation and Performance of a Solar Cooling System
Roberta Vella, Institute of Sustainable Energy

D-01 Experimental Investigation and Performance Evaluation of a Novel Vacuum Tube Solar Air Collector
Tareq Abu Hamed, Dead Sea and Arava Science Center

D-02 Efficient Design of Solar Assisted Heating Systems for Multi-Family Houses
Klaus Backes, Hochschule Düsseldorf

D-03 Drainback Solar Thermal Systems in Switzerland – Market Overview and Main Barriers
Mircea Bunea, Laboratory of Solar Energetics and Building Physics (LESBAT)
Presented by Martin Guillaume, Laboratory of Solar Energetics and Building Physics (LESBAT)

D-04 Potentials of Solar-Ice Systems for Multi-Family Buildings
Daniel Carbonell, SPF Institute for Solar Technology

D-05 Comparative Dynamic Performance Tests of Two Real Technology Packages for Buildings Heating System Retrofit
David Chèze, CEA
Presented by Antoine Leconte, CEA LITEN

D-06 Analysis of Energy Savings, Environmental Benefits and Maintenance Costs in Solar Thermal Systems for DWH in Residential Buildings
Ricard Consul, Universitat Politècnica de Catalunya BarcelonaTech

D-07 TATA Steel Research Study: Factors Affecting Pressure Drop on a Closed-Loop System
Francisco Manuel Funes Garrido, AECOM

D-08 Experimental Analysis of Air-Water Heat Exchanger with Microchannel Coil Exposed to Different Working Parameters
Vladimir Glazar, University of Rijeka

D-09 Sustainability Assessment of Most Relevant Solar Thermal Heat Systems
Harald Kicker, Johannes Kepler University Linz

D-10 Simulation-Based Optimization of Solar Combisystem. Sensitivity Analysis at Optimum
Oleh Kusyy, Kassel University

D-12 Simulation and Monitoring of PV Heat Pump System with Seasonal Storage
Tomas Matuska, UCEEB, Czech Technical University in Prague

D-13 Simulation of Combined Heating Heat Pump System with Grey Water and Solar Energy
Andreu Moià-Pol, Universitat de les Illes Balears

D-14 Reuse of the Recovered Heat From a Wastewater Treatment Plant in the Solar-Assisted Air-Conditioning Systems: "THERBIOR" Project
Francisco Portillo, University of Almería

D-15 Polymer Collectors with Temperature Control - Thermosyphon Valve Development and System Integration
Alexander Thür, University of Innsbruck

D-16 Indirect Solar Drying of Agricultural Products (Fruits) Using a Thermal/ Photovoltaic Hybrid System
Jonas Torres Montealban, Universidad Autonoma Chapingo

D-17 Review of Combined Solar Thermal and Heat Pump Systems Installations in Lithuanian Hospitals
Rokas Valancius, Kaunas University of Technology

D-18 Solar Thermal Systems vs. Photovoltaic Systems. Case Study: Single Family Building in Lithuania
Rokas Valancius, Kaunas University of Technology

D-19 Space Cooling Application with Unglazed Solar Absorber
Carsten Wemhoener, IET Institute of Energy Technologies

E-02 Field Test Results of an Innovative PV/T Collector for an Outdoor Swimming Pool
Laetitia Brottier, DualSun

E-03 Electrical and Thermal Performance Evaluation of a District Heating System Composed of Asymmetric Low Concentration PVT Solar Collector Prototypes
Diogo Cabral, Högskolan I Gävle

E-04 Potential of Covering Electricity Needs of a Flat of a MFH with Decentral Compact Heat Pumps with PV – Simulation Study for Different DHW Profiles and PV Field Sizes
Ton Calabrese, UIBK

E-06 Optical Configuration for Homogeneous Flux in Multifaceted Solar Concentrators
Adriana E. Gonzalez-Cabrera, Institute of Geophysics/UNAM

E-07 Assessment of the Suitability of Different Photovoltaic Cell Technologies for Product Development of Building Integrated Solutions Using The Hierarchy Process (AHP)
Zoheir Haghighi, TUDelft

E-08 Economic Feasibility of Solar PV System for Buildings
Bin-Juine Huang, National Taiwan University

E-09 Implementation and Experimental Validation of a Photovoltaic-Thermal (PVT) Collector Model in TRNSYS
Danny Jonas, Saarland University

E-10 PVT and Ground Coupled Air to Water Heat Pump System Twin Test Cell Study
Kwangseob Lee, Korea University of Science Technology

E-11 Longterm Measurement of PV Installations – Toward 40 Years Lifetime!
Urs Muntwyler, PV Laboratory Berne University of Applied Sciences

E-12 PV and EV More Than Synergies - Successes in 40 Years
Urs Muntwyler, PV Laboratory Berne University of Applied Sciences

E-13 Study on Distributed MPPT System in Solar EV
Yuki Nemoto, Kanagawa Institute of Technology

E-14	Methodology to Evaluate the Production Costs of Innovative Polymeric PVT-Concepts *Andreas Piekarczyk, Fraunhofer ISE*
E-15	A Method for Snow Removal from Photovoltaic-Thermal Panels *Ali Rahmatmand, Queen‘ s University*
E-16	Solar PV Pumping Systems in Chile *Roberto Roman, University of Chile*
E-17	Design and Performance Assessment of a Prefabricated BIPV/T Roof System Coupled with a Heat Pump *Efstratios Dimitrios Rounis, Concordia University*
E-18	Experimental Investigation of PVT Collectors with Phase Change Material *Raquel Simón, EndeF Engineering*
E-19	PV Power Production Estimation by Using Radiometric and Meteorological Data *Mauricio Trigo, University of Antofagasta*
E-20	Improvements on the Efficiency of the Photovoltaic Panel by Integrating a Spray Cooling System with Shallow Geothermal Energy Heat Exchanger *Li-Hao Yang, Department of Mechanical Engineering, National Taiwan University*
E-21	Extended Hottel-Whillier Models for PVT-Collectors *Daniel Zenhäusern, HSR Rapperswil, SPF Institute for Solar Technology*
F-01	Stratification in Large Thermal Storage Tanks *Mattia Battaglia, SPF Institute for Solar Technology*
F-02	Thermal Characterization of Ettringite-Based Materials for Seasonal Energy Storage *Bao Chen, Institut National des Sciences Appliquées de Lyon*
F-03	Power Demand and Energy Cost Minimisation via Optimal Control of Consumer Thermal Storage *Luigi Cirocco, University of South Australia*
F-05	Experimental Study of a 600 W Seasonal Solar Heat Storage Reactor for the Heating of Buildings *Samuel Hennaut, Université de Liège*
F-06	Solar Sorption Heat Pump Storage System *Henner Kerskes, Research and Testing Centre for Thermal Solar Systems (TZS)*
F-07	Sensible Thermal Energy Storage in Packed Bed for Industrial Solar Applications *Burcu Kocak, Wavin TR Plastic Co.*
F-08	High-Performance Thermochemical Energy Storage Based on Transition Metal Ammoniates *Danny Müller, TU Wien*
F-09	Measurement Procedure for Phase Change Material´s Durability Characterization *Irene Pascual, University of Almería*
F-10	Modeling and Validation of Different Heat Exchanger Geometries for Solar Ice Storage Systems *Stefanie Paulini, Hof University*
F-11	Design of a Seasonal Storage for a Solar District Heating in Florence *Michele Salvestroni, Università degli Studi di Firenze*
F-12	Design and Evaluation of a Compact Thermal Storage System Using River Stones for a Continuous Drying Process of Agricultural Products in Peru *Ronald Roussevelt Tipula Ramos, Pontificia Universidad Católica del Perú*
F-13	Development of a Solar Paddy Dryer by Fluidization Technique Using Heat from a Solar Pond *Sura Tundee, Rajamangala University of Technology Isan Khon Kaen Campus*
F-14	Experimental Implementing of PCM in Passive Climatization at Pilot Scale *Islamán Villalobos, Universidad de Antofagasta*
F-15	High Temperature Seasonal BTES for Effective Load Shifting and CO_2 Emission Reduction *Robert Weber, Empa*
F-16	Energy And Exergy Analysis of a Cascaded Latent Heat Storage: An Experimental Study *Yao Zhao, Shanghai Jiao Tong University*

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12:30 - 13:30	**Lunch Break**

13:30 - 15:00	**Session 1-A: PV and PVT Systems for Buildings and Industry** ROOM 3.011 *Chair: Asier Sanz Martinez, TECNALIA Research & Innovation*
13:30	Development and Field Testing of a Novel Hybrid PV-Thermal Solar Collector *Adrian Murrell, Naked Energy Ltd*
13:45	Organic PVT - A Novel Hybrid Collector Combining Organic Photovoltaics and Polymer Absorbers *Manuel Lämmle, Fraunhofer ISE*
14:00	Glazed PVT Collector Integrated Into Façade Module *Nikola Pokorny, University Centre for Energy Efficient*
14:15	Performance Assessment of a Photovoltaic-Thermal Roof with Modular Heat Exchanger *Federico Giovannetti, ISFH*
14:30	Multi-Objective Optimization of a Solar Heat Pump System Using PVT and Ice-Based Latent Storage *Justin Tamasauskas, Natural Resources Canada/CanmetENERGY*
14:45	Numerical Simulation of the Thermal Performance of Two Prototypes of CPC Collectors That Use Bifacial PV Cells *Miguel Lança, Instituto Superior Técnico*

13:30 - 15:00	**Session 1-B: Thermal Storage** ROOM 3.010 *Chair: Wim van Helden, AEE Intec*
13:30	Simulations and Experiments of Melting of Encapsulated Phase Change Materials *Antonio M. Puertas, Universidad de Almeria*
13:45	Encapsulation of Inorganic Phase Change Materials by Sol-Gel Method for Thermal Energy Storage *Beatriz Lucio, IMDEA Energy Institute*
14:00	Validation of an Ice Storage Model and its Integration Into a Solar-Ice System *Daniel Philippen, SPF Institute for Solar Technology and Bernard Thissen, Energie Solaire SA*
14:15	Combined Short and Long Term Heat Storage with Sodium Acetat Trihydrate in Cylindrical Tanks *Gerald Englmair, Technical University of Denmark*
14:30	Numerical and Experimental Investigation on a Cascaded Latent Storage Heat Pump Water Heater *Remo Waser, Institut für Maschinen und Energietechnik, Hochschule Luzern HSLU*
14:45	Selection of Latent Heat Storage for Solar Thermal Application *Avinash Waghmare, AISSMS College of Engineering, Pune*

13:30 - 15:00 Session 1-C: Solar Buildings

ROOM 3.008
Chair: Sebastian Herkel, Fraunhofer ISE

13:30	Difference in Evaluation of Discomfort Glare from Windows between Middle-Eastern and Japanese Students *Toshie Iwata, Tokai University*
13:45	Solar Seminar Room in the University of Balearic Islands with a New Advanced Radiant System *Andreu Moià-Pol, Universitat de les Illes Balears*
14:00	High Solar Fraction by Thermally Activated Components *Thomas Ramschak, AEE INTEC*
14:15	An Aesthetic Energy Producing Roof with Integration of PV Modules and Solar Thermal Collectors *Corry de Keizer, SEAC*
14:30	Semi-Virtual Tests of a System Using Exhaust Air, Grey Water and Solar Heat for Domestic Hot Water and Space Heating Needs of a Multifamily House *Antoine Leconte, CEA LITEN*

13:30 - 14:45 Swissolar Solar Heating Conference Opening: Policies and the Market Session

AULA
Chair: David Stickelberger, Swissolar
Talks in this session will be given in German with simultaneous translation into English.

Welcome
David Stickelberger, Swissolar

Welcome Message from the Canton of St. Gallen
Marcel Sturzenegger, St. Gallen Energy Department

Swiss Heat Initiative – Economic Alliance Promoting the Change to Thermal Energy
Stefan Batzli, AEE SUISSE

The Swiss Solar Heating Market: Present Status and Outlook
David Stickelberger, Swissolar

Five Trends to Pump New Energy Into Solar Heating
Roger Hackstock, Austria Solar

15:00 - 15:30 Coffee Break

The coffee break is sponsored by suissetec.
Thank you!

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15:15 - 17:15 Swissolar Solar Heating Conference 2: Technology and Research Session

AULA
Chair: David Stickelberger, Swissolar
Talks in this session will be given in German with simultaneous translation into English.

Solar Energy for Process Heat: Workshop Report from the Sol-Ind Swiss Project
Marco Caflisch, SPF Institute for Solar Technology and Martin Guillaume, Lesbat

Ecological Conversion of the Heating Supply Funded by a Community Association: An Example in Practice
Bruno Hoesli, Planar AG für Raumentwicklung

Solar Panels on Facades: Use, Products, Structural Engineering
Andreas Haller, Ernst Schweizer AG

Building Technology in the Digital Upwind – Opportunities and Challenges for us as Market Players
Christian Beckmann, Danfoss Heating Segment

Seasonal Thermal Storage: Current Status and Outlook
Harald Drück, ITW Stuttgart

Heat & Electricity from PVT Panels – the Market, Experience, Trends
Daniel Zenhäusern, HSR Rapperswil, SPF Institute for Solar Technology

Closing Remarks

15:30 - 17:00 Session 2-A: PV and PVT Systems for Buildings and Industry

ROOM 3.011
Chair: Jean Christophe Hadorn, Solar Energies & Strategies

15:30	Solar Hybrid PVT Coupled Heat Pump Systems Towards Cost-Competitive NZEB *Asier Sanz Martinez, TECNALIA Research & Innovation*
15:45	A Techno-Economic Comparison Between PV and PVT Integrated Ground Source Heat Pumps for Multi-Family Houses *Nelson Sommerfeldt, KTH Royal Institute of Technology*
16:00	Experimental Performance Evaluation of PV/T Panels at Negative Reduced Temperatures *Riccardo Simonetti, Politecnico di Milano*
16:15	Comparative Economic Analysis of Single and Dual-Fluid Based Photovoltaic Thermal Systems for Building Energy Needs *Muhammad Imtiaz Hussain, Green Energy Technology Research Center, Kongju National University*
16:30	An Overview of PVT Modules on the European Market and the Barriers and Opportunities for the Dutch Market *Corry de Keizer, SEAC*

15:30 - 17:00	**Session 2-B: Thermal Storage** ROOM 3.010 *Chair: Ulrike Jordan, University of Kassel*
15:30	Compact Seasonal Thermal Energy Storage for Solar Energy Systems *Mihaela Dudita, SPF Institute for Solar Technology* *Presented by Xavier Daguenet-Frick, SPF Institute for Solar Technology*
15:45	Semi Continuous Thermochemical Reactor for Thermal Storage *Joël Wyttenbach, CEA-INES*
16:00	Dual-Storage Heat Recuperation System for Temperature-Swing Solar-Thermochemical Redox Cycles *Lukas Geissbühler, ETH Zürich*
16:15	Thermal Collection and Seasonal Storage Potential of a Mixed-Use Neighborhood *Caroline Hachem-Vermette, University of Calgary*
16:30	Performance Results for the First Year of Operation of a Seasonal Storage Solar Combisystem for a Single Detached House *Curtis Meister, Carleton University*
16:45	Decentralized DHW Production from Exhaust Air in the Bathroom Prewall *Florian Ruesch, SPF Institute for Solar Technology*

15:30 - 17:00	**Session 2-C: Solar Buildings** ROOM 3.008 *Chair: Carsten Wemhöner, HSR*
15:30	Definition of a Reference Office Building for Simulation Based Evaluation of Solar Envelope Systems *Matteo D'Antoni, Eurac Research*
15:45	bFAST: A Methodology for Assessing the Solar Potential of Façades in Existing Building Stocks *Cristina Polo López, SUPSI, University of Applied Sciences and Arts of Southern Switzerland*
16:00	Measurement- and Simulation-Based Analysis of Solar Heat and Electricity Supply Concepts for Buildings *Axel Oliva, Fraunhofer ISE* *Presented by Korbinian Kramer, Fraunhofer Institute for Solar Energy Systems ISE*
16:15	Numerical Model of the Thermal Performance of Buildings Oriented to the Design of Net Zero Energy Buildings *Jordi Macià, Fundació CTM Centre Tecnològic*
16:30	Control Strategies for a Residential Property with Solar Building, Thermal and Electricity Storages *Rinat Abdurafikov, VTT Technical Research Centre of Finland Ltd*
16:45	The SOLAR DECATHLON Knowledge Platform - Concept and Application *Susanne Hendel, Bergische Universität Wuppertal*

17:00	**Apéro Riche**

18:30	**Young ISES Get-Together, please see page 37 for more information.**

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08:30 - 10:15	**Keynote Lectures** AULA *Chair: Wolfgang Streicher, University of Innsbruck*
08:30	Energy Effcient Buildings - Will Digitalization be a Game Changer? *Sebastian Herkel, Fraunhofer ISE*
08:55	Solar Renovation of Historic Buildings: Towards a Zero Energy Built Heritage *Daniel Herrera, Eurac Research*
09:20	IEA Study on Solar Cooling Demand *Thibaut Abergel, IEA*
09:45	Current Status of Solar Air Conditioning: Findings and Feedback from IEA SHC Task 53 *Daniel Neyer, daniel neyer brainworks*

Sebastian Herkel

Sebastian Herkel is head of the Energy Efficient Building Department at the Fraunhofer Institute for Solar Energy Systems in Freiburg. He graduated in mechanical engineering in 1991 from the University of Karlsruhe (T.H.) with a degree in engineering. He works as a research scientist in applied research on energy efficiency and renewable energy systems in buildings. His focus is on integral energy concepts for buildings, scientific analysis of building performance, building simulation and efficient building energy supply systems.

Thibaut Abergel

Mr. Abergel is a buildings sector analyst at the International Energy Agency within the Energy Technology and Policy division. He contributes to various IEA analyses, including the special report on the future of cooling and the IEA flagship publications on Energy Technology Perspectives and Tracking Clean Energy Progress. He is involved in different collaboratives such as the Global Alliance for Buildings and Construction and works closely with the IEA's Technology Collaboration Programmes. Mr. Abergel holds a Master of Science and Excecutive Engineering from MINES ParisTech with a specialisation on energy management.

Daniel Herrera

Daniel Herrera holds a MArch from the Technical University of Madrid (Spain) and a PhD degree from the Robert Gordon University (UK). He is senior researcher at Eurac Research, Italy, and his research focuses on the development of energy retrofit solutions for historic buildings, particularly on their hygrothermal performance. As an architect, he has been involved in several projects of heritage conservation in Spain, from the Cathedral-Mosque of Cordoba to the Plaza Mayor of Madrid. Within the academic environment, he has taken part in different research projects and teaching activities in Italy, Spain and the UK.

Daniel Neyer

Daniel Neyer is senior researcher at the Unit for Energy Efficient Buildings at University of Innsbruck and CEO of his consulting company danielneyerbrainworks. He is an Engineer holding a Master Degree in Eco Engineering and a Master Degree in Domotronic and gathered more than 10 years of R&D experience. His PhD-thesis is dealing with assessment and component development of new generation solar heating and cooling systems. He is involved in several national and international projects and is an Austrian expert in the IEA SHC Tasks. His main fields of activities are numerical simulations in HVAC's and buildings, component and system development and optimization as well as assessment and benchmarking of renewable heating and cooling systems.

10:15 - 10:45	Coffee Break

10:45 - 11:30 Session 1-A: Solar Resource and Energy Meteorology

ROOM 3.011
Chair: Christof Biba, HSR

10:45	Brazilian Photovoltaic Potential *Enio Bueno Pereira, National Institute for Space Research*
11:00	Most Probable Operating Conditions and Performance Assessment of Four PV Technologies at 10 Locations in India *N C Gupta, USEM GGSIP University*
11:15	Assessing Solar Electricity Potential and Prospective Present Day Costs for a Low Latitude Caribbean Island: Trinidad *Nalini Dookie, Department of Physics*

10:45 - 11:30 Session 1-B: Solar Heat for Industrial Processes

ROOM 3.010
Chair: Federico Giovannetti, ISFH

10:45	Environmental Assessment of Industrial Solar Thermal Systems *Paris Fokaides, Frederick University, Cyprus*
11:00	Cleaning Strategies for Fresnel Linear Concentrator Mirrors in Solar Heating Plants *Roberto Gabbrielli, Department of Civil and Industrial Engineering of the University of Pisa*
11:15	Solar Heat in Industrial Processes in Switzerland - Theoretical Potential and Promissing Sectors *Martin Guillaume, Laboratory of Solar Energetics and Building Physics (LESBAT)*

10:45 - 11:30 Session 1-C: Solar Education

ROOM 3.008
Chair: Chris Bales, Dalarna University

10:45	Project „SBS 2020“ (Solar Education and Training in Switzerland) *David Stickelberger, Swissolar*
11:00	Understanding the Dynamics of Solar Energy Systems by Using Simulation Narratives *Andreas Witzig, Institute of Computational Physics, Zurich University of Applied Sciences*
11:15	On the Importance of Education when Implementing Renewable Energy *Lars Broman, Strömstad Academy*

10:45 - 11:30 SAC-1: Short Poster Presentations

AULA
Chair: Christian Schweigler, Munich University of Applied Sciences

Authors of the posters M01–15 will present their work in a short oral presentation.

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11:30 - 12:30 Poster Session 2

Topics G, H, J: FOYER 1st floor building 1
Topics I, K, L, M: ROOMS 4.112 / 4.113

The poster numbers are based on topics:

G	Solar Thermal Collectors and Solar Loop Components
H	Testing & Certification
I	System Simulation (2nd SIGES Conference on the Simulation of Building-Integrated Energy Systems)
J	Solar Resource and Energy Meteorology
K	Solar Education
L	Renewable Energy Strategies and Policies
M	Solar Air Conditioning and Refrigeration (8th International Conference on Solar Air Conditioning)

G-01	Influence of Using Different SiO_2 Antireflective Coatings and Sintering Conditions on the Durability and Optical Performance of the Selective Solar Absorber *Meryem Farchado, CIEMAT*
G-02	Basic Study on Flow Stabilization of Top-Heat-Type Thermosiphon *Toru Fujisawa, Kanagawa Institute of Technology*
G-03	Ray Tracing Method for the Evaluation of Yearly Performance of a Solar Thermal Concentrator *Héctor García, Universidad Autónoma de Nuevo León*
G-04	Tailoring Alumina Matrix Optical Properties for Colored Solar Thermal Absorber Coatings *Luminita Isac, Transilvania University of Brasov*
G-05	Design and Fabrication of a Solar Heating System with Linear Fresnel Lens for Greenhouse Culture in Iran *Davoud Momeni, Agricultural Engineering Research Institute*
G-06	Experimental Investigations on the Stagnation Behavior of Thermochromic Flat Plate Collectors *Sebastian Müller, Institut für Solarenergieforschung GmbH*
G-07	Solar Flux Map Distribution of a Parabolic-Spheric Dish Based on Photographic Method *Mattia Roccabruna, FBK*
G-08	A High Concentration Solar System with Fixed Focus *Roberto Roman, University of Chile*
G-09	Abrasion and Cleaning Tests on Antireflective and Antireflective/Antisoiling Coatings for Solar Glass Glazing *Gema San Vicente, CIEMAT*
G-10	Theoretical Analysis of Combined Solar System Based on Dual Purpose Solar Collector *Nikola Pokorny, University Centre for Energy Efficient Buildings of CTU in Prague*
G-11	Is Romania a New Market? An Overview on the Romanian Solar Thermal Market and New Building Integrated Flat Plate Collectors *Ioan Totu, The Center of Technology, Inventiveness and Business in Brasov* *Presented by Gheorghe Daniel Voinea, The Centre for Technology, Innovation and Business CTIB*
G-12	Electroplating of Selective Surfaces for Concentrating Solar Collectors *Erik Zäll, Umeå University*
H-01	Optical Properties of Solar Absorbers – Results on Round Robin and Guidelines *Maria João Carvalho, LNEG*
H-02	In Situ Characterization of Thermal Collectors in Field Installations *Sven Fahr, Fraunhofer ISE*
H-03	Comparative Analysis of Life-Cycle Assessment Tools (LCA) Using the Example of Different Energy Supply Variants of a Purpose-Built Building *Ronny Kastner, Bavarian Center for Applied Energy Research (ZAE Bayern)*

H-04 Quasi-Dynamic Testing of a Novel Concentrating Solar Collector According to ISO 9806:2013
Ali Kurdia, Independant

H-05 Analysis of Applicability of PLPE Procedure for the Test of a Solar Cooling System
Diego Menegon, Eurac Research

H-06 Measurement of the Specific Heat Capacity of Heat Transfer Fluids with High Accuracy
Andreas Reber, SPF Institute for Solar Technology

H-07 Development of a Solar Water Heaters Efficiency Test Facility in Uruguay Under ISO Standards
Juan Rodriguez, University of the Republic

H-08 CFD-Based Development, Testing and Optimization of Flat Plate Collectors
Beate Vetter, Institute of Thermodynamics and Thermal Engineering (ITW), University of Stuttgart

I-01 Performance Analysis of Solar Desiccant Cooling System Integrated with M-cycle Evaporative Cooler
Ghulam Chaudhary, UET Taxila

I-02 Dynamic Modeling and Optimization of Energy Use in Retrofitted Buildings at District Heating Level
Jon Iturralde, Tecnalia

I-03 Simulated Evaluation and Testing Environment for Optimized Operation Strategy of Energy Storage in Low-Energy Solar House
Kyoung-ho Lee, KIER (Korea Institute of Energy Research)

I-04 Simulated Training Performance of a Simplified Two-Layer Thermal Model for Solar Seasonal Hot Water Storage Tank
Kyoung-ho Lee, KIER (Korea Institute of Energy Research)

I-05 Theoretical Analysis of Photovoltaic Panels Using a Spray Cooling System with a Shallow Geothermal Energy Heat Exchanger
Jyun-De Liang, Department of Mechanical Engineering / National Taiwan University

I-06 Big Data for Planning and Monitoring of Solar Systems
Stephan Mathez, Solar Campus GmbH

I-07 Techno-Economic Study of an Innovative Hybrid Fresnel Collector to Supply Air-Conditioning and Electricity in the Built Environment
Alaric Montenon, The Cyprus Institute

I-08 BIM a Driver for Energy Transition and BIVP Adoption
Van Khai Nguyen, CADCAMation SA

I-09 Solar and Multi-Generation Modeling Based on a Natural Gas Driven Internal Combustion Engine
Nnamdi Okafor, University of Alabama at Birmingham

I-10 A Comparison of Stratified Heat Storage With and Without Modular PCM Storage Through Simulation
Valerie Pabst, University of Applied Sciences Ulm

I-11 Load Shape Comparison of Typical Residential Households in California and the Netherlands
Heidi von Korff, Stanford University

I-12 Integrating Polysun into a Test Bench for Prosumer Hardware
Steffen Wienands, Bern University of Applied Sciences, Institute for Energy and Mobility Research IEM

J-01 Comparison and Accuracy Evaluation of Two Satellite-Derived Databases Versus Ground Measurements. Case Study: Benguerir Morocco
Alae Azouzoute, Institut de Recherche en Energie Solaire et Energies Nouvelles - IRESEN

J-02 Comparison Between Modelled and Measured Sky Temperature for Different Models Which Consider Cloudy Sky Conditions and an Experimental Site in Stuttgart
Reiner Braun, University of Applied Science Stuttgart (HFT)

J-03 Mid-Term Photovoltaic Self-Consumption Net Generation Forecast Based on Recurrent Neural Networks: Applied to Tertiary Facilities at Balearic Islands
Vicente Canals, University of Balearic Islands

J-04 Accuracy of Solar Resource Assessments on the Basis of Publicly Available GHI Databases
Matthias Egler, e4r - engineers for renewables GmbH

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J-05 Investigation of Solar Power Potential and Water Availability for Solar Distillation in Rajasthan, India
Nikhil Gakkhar, Ministry of New and Renewable Energy

J-06 Short Term PV Forecasting Using Satellite Data for Austria
Dominik Kortschak, Joanneum Research

J-07 The Spatial and Temporal Patterns of the Surface Solar Irradiation in Northeastern Region of Brazil
Francisco Lima, INPE – Brazilian Institute for Space Research

J-08 Day-Ahead Forecasts of GHI and DNI for Solar Energy Systems Operation in Southern Portugal
Francisco Lopes, Renewable Energies Chair, University of Évora

J-09 Satellite-Derived Hourly, Daily, and Monthly Global, Direct, and Diffuse Irradiance Validation, in Arid Climate
Luis Martin Pomares, QEERI

J-10 Solar Irradiance Narrowband Measurement Validation by Using Broadband Measurements
Aitor Marzo, CDEA - Universidad de Antofagasta

J-11 Regression by Integration Demonstrated on Angström-Prescott-Type of Relations
Heinrich Morf, Senior Member ISES

J-12 Satellite-Based Method for Computing Solar Radiation Over Different Regions in Algeria
Aboura Radia, Space Technic Center CTS

J-13 Predicting Global Horizontal Solar Radiation Using Regression Analysis: Validation of Models in Mauritius
Yatindra Kumar Ramgolam, University of Mauritius

J-14 Urban Climate – Impact on Energy Consumption an Thermal Comfort of Buildings
Jan Remund, Meteotest

J-15 Evaluation of Satellite and Reanalysis Products (NCEP-NCAR, NCEP-DOE, NCEP-FNL, GFS, JRA-55) of Solar Radiation over South Pakistan
Zia ul Rehman Tahir, University of Engineering and Technology Lahore

J-16 Evaluation of Solar Radiation from ERA-Interim, GFS, CFSR, JRA-55, MERRA-2, NCEP-FNL Satellite Datasets With Measured Data for Quetta, Pakistan
Zia ul Rehman Tahir, University of Engineering and Technology Lahore

J-17 Evaluation of Solar Radiation from MERRA, MERRA-2, NCEP-NCAR, NCEP-DOE, CFSR and ERA-Interim Reanalysis Datasets Against Surface Observations for Multan, Pakistan
Zia ul Rehman Tahir, University of Engineering and Technology Lahore

J-18 Monthly Solar Irradiance Variability in Brazilian Climate Zones
Eduardo Weide Luiz, Center for Earth System Science, National Institute for Space Research

J-19 Prophesy: A Simulation Tool for Solar Energy Forecast Errors in Future Power Grids
Kevin Winter, Fraunhofer Institute for Energy Economics and Energy System Technology IEE

J-20 A First Approach of the Influence of the Forecasting Horizon in the Electricity Generation Simulation of a Solar Tower Plant
Joaquín Alonso-Montesinos, University of Almería

K-01 A Simple Tool for Assessing Solar and Daylight Access in Urban Canyons
Raphaël Compagnon, Haute Ecole d' Ingénierie et d' Architecture de Fribourg

K-02 Development of a Compact and Didactic Solar Energy Kit Using Arduino
João Costeira, Universidade do Minho

K-03 Solar Education - The Path to Development Improvement
Shakhista Maksudova, Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan

K-04 Using Heliodon in the Education of Solar Buildings Design in the Age of Computer Simulations
Luka Pajek, University of Ljubljana, Faculty of Civil and Geodetic Engineering

K-05 Dialogue Between Research Solar Practices and Training Activities: Interactive Webinar by Integration of ICT in Education
Cristina Polo López, SUPSI, University of Applied Sciences and Arts of Southern Switzerland

K-06	Exploration Applied in Wind Energy Teaching *Jonas Torres Montealban, Universidad Autonoma Chapingo*
L-01	Economic Viability of Solar PV and Diesel Generator Hybrid System for Nigerian Private Businesses *Adewale Adesanya, Europa Universität Flensburg*
L-02	Assessment of Thermal Performance of Cool Versus Green Roofs. Prediction of Their Impact Over Urban Temperatures in Arid Cities *Noelia Alchapar, Instituto de Ambiente, Hábitat y Energía (INAHE)*
L-03	An Investigation on the Power Flow Analysis in the Micro Grid Structures of Distributed Photovoltaic Power Generation Systems *Halil Ibrahim Aydinöz, TEIAS*
L-04	Wind-Solar Hybrid Plant Risk Analysis: A Case Study for Caetite Plant *Diego Carvalho, Federal University of Itajuba*
L-05	Effects of Dead End Street Geometry in Vernacular Urban Fabric on the Urban Heat Island Risk in Hot and Arid Regions *Zahra Ferhat, University of Biskra*
L-07	A Review of Renewable Energy Trends in Ethiopia *Sameer Hameer, Bahir Dar Energy Centre, BIT-BDU*
L-08	Impact of Localized Solar Resource Integration on Energy Consumption and Greenhouse Gas Emissions: A Case Study of the Residential Sector in the United Arab Emirates *Ahmed Kiani, Core Technlogies*
L-09	Photovoltaics or Solar Thermal –The Winner Takes it All? *Urs Muntwyler, PV Laboratory Berne University of Applied Sciences*
L-10	Economic Evaluation of the First Grid-Connected Photovoltaic System in the Aysén Region Under the Current Law of Distributed Generation in Chile *Juan Carlos Osorio-Aravena, Energy and Environment Group, Campus Patagonia, Universidad Austral de Chile*
L-11	Accompanying Project Owners and Professionals All the Way to Secure Solar Thermal Plants *Edwige Porcheyre, Enerplan*
L-12	Solar Investment Trust Funds, Striking the Right Balance of Solar Nano and Micro Grid Deployment, in the Fight Against Non-Literacy Around the World *Ignacio Smith, SM Solar*
L-13	HVACC 4.0: A Chance for Managing the Climate Change and Energy Transition *Thomas Noll, easy-tnt*
M-01	New Opportunities for HVACR by Utilization HVACC 4.0 *Thomas Noll, easy-tnt*
M-02	Design, Fabrication and Analysis of Solar Vapour Absorption Refrigeration System *Claude Vidal Aloyem Kaze, University of Yaounde I*
M-03	Selection of a Low-Cost and High-Performance Working Fluid for a Solar Absorption AC System and Techno-Economic Study in the Mexican Climate Conditions *Amín Altamirano Cundapí, LOCIE Laboratory - Université Savoie Mont Blanc*
M-04	Annual Operating Energy Savings of a Hybrid Solar HVAC System Based on a Desiccant Wheel and Indirect Evaporative Cooling *Francisco Comino, Universidad de Córdoba*
M-05	PV Driven Dew-Point Cooling for Australia *Mark Goldsworthy, CSIRO*
M-06	Integration of Solar Hybrid Photovoltaic/ Thermal and Heat Pump Space Heating/ Cooling Systems Using a Split Heat Flow Configuration *Khaled M. Ramadan, Rovira i Virgili University, CREVER*
M-07	Comparison of Modeled and Measured Heat and Mass Transfer in a Liquid Desiccant Air-Conditioning System *Wael Mandow, Institute for Thermal Energy Engineering*
M-08	Development of Solar Assisted Sorption Unit for Extraction of Water from Ambient Air in Desert Climate *Tomas Matuska, UCEEB, Czech Technical University in Prague*
M-09	New Water Adsorbent for Adsorption Driven Chillers *Alenka Ristić, National Institute of Chemistry Slovenia*
M-10	Desiccant Based Evaporative Air Conditioning System for Hot and Humid Climate *Sehar Shakir, National University of Sciences & Technology (NUST)*
M-11	A Step Towards Energy Efficiency in Solar Thermal Energy: Solarized Trigeneration - A Review *Hemant Raj Singh, Malaviya National Institute of Technology Jaipur*
M-12	A New Methodological Approach to Retrofit Based on the Application of Innovative Heating and Cooling Storage Mainly Re-Using Existing Systems *Lavinia Tagliabue, University of Brescia*
M-13	Efficient Solar Driven Air Conditioning System for Hot Climates: Case Study of Doha *Zak Tamainot-Telto, University of Warwick - School of Engineering*
M-14	Performance Investigation of Liquid Desiccant Dehumidification System Integrated with Solar Thermal Energy and Shallow Geothermal Energy *Ching-Yi Tseng, National Taiwan University*
M-15	Application of PCM in Building Envelope of Lightweight Prefabricated Houses Coupled with PV – Solution for Air-Conditioning Reduction in Summer *Eva Zavrl, University of Ljubljana, Faculty of Mechanical Engineering*

12:30 - 13:30 **Lunch Break**

13:30 - 15:00 Session 2-A: Solar Resource and Energy Meteorology

ROOM 3.011
Chair: Jan Remund, Meteotest

13:30	Validation of Real-Time Solar Irradiance Simulations Over Kuwait Using WRF-Solar *Christian Gueymard, Solar Consulting Services*
13:45	Climatic and Global Validation of Precipitable Water Product from MODIS Aqua, Terra and Combined Satellite Platforms Against 452 AERONET Sites *Jamie M. Bright, The Australian National University*
14:00	Progress in Sky Radiance and Luminance Modeling Using Circumsolar Radiation and Sky View Factors *Stoyanka Ivanova, University of Architecture, Civil Engineering and Geodesy*
14:15	Effect of Solar Position Calculations on Filtering and Analysis of Solar Radiation Measurements *Daniel Perez-Astudillo, QEERI, HBKU* *Presented by Dunia Bachour, QEERI, HBKU*
14:30	Solar Irradiation Over a Flat Surface with Different Tracking Strategies *Adriana E. Gonzalez-Cabrera, Institute of Geophysics/UNAM*

13:30 - 15:00 Session 2-B: Solar Heat for Industrial Processes

ROOM 3.010
Chair: Federico Giovannetti, ISFH

13:30	Exploring and Exploiting Solar Thermal Potential in Chilean Manufacturing Industry *Daniel González Castellví, Aiguasol Latam*

13:45	RESSSPI: The Network of Simulated Solar Systems for Industrial Processes *Miguel Frasquet, University of Seville*
14:00	Optical Analysis of an Evacuated Tube Collector with Built-In Semicircular Concentrator for Process Heat Applications *Rosa Christodoulaki, Centre for Renewable Energy Sources and Savings*
14:15	Standardisation of Solar Process Heat Applications to Increase Market Penetration *Bastian Schmitt, University of Kassel, Institute of Thermal Engineering*
14:30	Solar Heat Integration in Rotational Molding Process: Case Study *Nour Eddine Laadel, IRESEN*
14:45	Thermal Analysis and Validation of a Geodesic Dome Dryer for Capsicum Baccatum *Sandra Vergara, Grupo de Apoyo al Sector Rural from Pontificia Universidad Católica del Perú*

13:30 - 15:00 Session 2-C: System Simulation (2nd SIGES Conference)

ROOM 3.008
Chair: Andreas Witzig, ZHAW

13:30	BIM Use Case: Model-Based Performance Optimization *Marc Jakobi, Vela Solaris AG*
13:45	BIM-to-BEPS Conversion Tool for Automatic Generation of Building Energy Models *María Regidor, CARTIF Technology Centre, Energy Division*
14:00	PIPE Network Analysis for Solar Thermal Plants *Ralph Eismann, FHNW*
14:15	Model Predictive Control for Building Automation *Peter Bolt, Institute of Applied Mathematics and Physics/ZHAW*
14:30	An Improved Model for Phase Change Material (PCM) Thermal Storage Tanks *Manuel Andrés Chicote, CARTIF Technology Centre*
14:45	Potential of Direct Solar Thermal Driven Absorption Heat Pump in Hybrid Systems *Florian Gritzer, University of Innsbruck, AB Energieeffizientes Bauen*

13:30 - 15:00 SAC 2: Components and Technical Innovation

AULA
Chair: Yanjun Dai, Shanghai Jiao Tong University

13:30	Experimental Comparison of Scroll and Swash-Plate Compressors for PV Driven Compression Chillers and Heat Pumps *Bernd Heithorst, Technical University of Munich, Institute of Thermodynamics*
13:45	Modified Solar-Assisted Ejector Cooling System *Bin-Juine Huang, National Taiwan University*
14:00	Development of a Novel Hybrid Solar and Heat Pump Driven LiBr-H_2O Absorption Cooling Cycle for Residential Application *Yanjun Dai, Shanghai Jiao Tong University*
14:15	Design and Practical Validation of a Hybrid Absorption/Compression Chiller Driven by Low-Grade Heat *Martin Helm, Hochschule München*

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14:30	Modelling of an Absorption Cycle With a Direct Ammonia Vapor Generator Inside a Concentrating Parabolic Trough Solar Collector *Sitki Berat Celik, Universidad Carlos III de Madrid*
14:45	Design and Construction of a 10 KW Sorption Heat Pump Prototype *Xavier Daguenet-Frick, SPF Institute for Solar Technology, HSR*

15:00 - 15:30	**Coffee Break**

15:30 - 17:00 Session 3-A: Testing & Certification

ROOM 3.011
Chair: Korbinian Kramer, Fraunhofer ISE

15:30	Ageing Performance of New Solar Cover Materials After Outdoor Exposure *Florian Ruesch, SPF Institute for Solar Technology*
15:45	Modelling the Relative Humidity Inside Flat Plate Collectors *Stephan Fischer, IGTE University of Stuttgart*
16:00	OTSun: An Open Source Code for Optical Analysis of Solar Thermal Collectors and PV Cells *Ramon Pujol-Nadal, University of Balearic Islands* *Presented by Julian Hertel, University of Balearic Islands*
16:15	Solar Heating Arab Mark and Certification Initiative (SHAMCI) *Ashraf Kraidy, The Regional Center for Renewable Energy and Energy Efficiency (RCREEE)*
16:30	Comparison of Two Whole System Test Methods: CCT and PLPE *Diego Menegon, Eurac Research*
16:45	Global Solar Certification Network (GSCN) and Global Certification of Collectors *Harald Drück, University of Stuttgart, Research and Testing Centre for Thermal Solar Systems (TZS)*

15:30 - 17:00 Session 3-B: Domestic Hot Water and Space Heating

ROOM 3.010
Chair: Tomas Matuska, UCEEB, Czech Technical University in Prague

15:30	Direct Solar Thermal Systems with Thermosiphon Frost Protection and Innovative Control Strategies Using a Thermo-Differential Bypass Valve *Nico van Ruth, Conico Valves bv*
15:45	Measurement Evaluation and Simulation of an Innovative Drainback Solar Combi-System *Yoann Louvet, University of Kassel*
16:00	Energetic Behaviour of a Solar Thermal Combi-System Producing Domestic Hot Water and Preheating the Ventilation Air in Individual Houses *Patricia Carbajo Jiménez, Université Savoie Mont Blanc*
16:15	The Development of the Sunridge, an Orientation Independent Thermal Solar System *Aart de Geus, ARTENERGY*
16:30	Single Source “Solar Thermal” Heat Pump for Residential Heat Supply: Performance with an Array of Unglazed PVT Collectors *Christian Schmidt, Fraunhofer ISE*

15:30 - 17:00	**Session 3-C: System Simulation (2nd SIGES Conference)** ROOM 3.008 *Chair: Andreas Witzig, ZHAW*
15:30	Quantifying the Potential of Smart Heat-Pump Control to Increase the Self-Consumption of Photovoltaic Electricity in Buildings *Yves Stauffer, CSEM*
15:45	From Simulation to Reality: IEC 61499 Compliant Control Applications for Solar Energy Systems *Marc Jakobi, Vela Solaris AG*
16:00	Using Behavior Simulation to Synthesize Electromobility Charging Profiles *Noah Pflugradt, Bern University of Applied Sciences*
16:15	Dynamic Modelling of a Hybrid Solar Thermal/Electric Storage System for Application in Residential Buildings *Andrea Frazzica, CNR ITAE*
16:30	Multiobjective Synthesis of a Polygeneration System for a Residential Building Integrating Renewable Energy and Electrical and Thermal Energy Storages *Edwin S. Pinto, University of Zaragoza*
16:45	Techno-Economic Evaluation of Energy Self-Sufficiency for the Energy Supply of Single and Multifamily Buildings *Johannes Bracke, Baumann Consulting*

15:30 - 17:00	**SAC-3: Solar Cooling Systems and Practical Application** AULA *Chair: Marco Beccali, University of Palermo*
15:30	Modelling and Simulation of a PV Driven Refrigerator with Phase-Change Materials in the Internal Walls *Adriana Coca-Ortegón, Universitat Rovira i Virgili*
15:45	Façade Integrated Photovoltaics for Solar Autonomous Cooling Applications *Tim Selke, AIT Austrian Institute of Technology GmbH*
16:00	Performance Analysis of a Small Scale Solar Cooling Plant Based on Experimental Measurements *Marco Pellegrini, University of Bologna*
16:15	Using the Heat of Sun to Cool: A Case Study of 100 TR (350KW$_{th}$) Solar Air-Conditioning System *Kedar Mehta, Technische Hochschule Ingolstadt*
16:30	Experimental Investigation on the Dynamic Performance of a State-Of-The-Art Solar Thermally-Driven Adsorption Chiller Integrated with a Gas Boiler *Elena Fuentes, IREC*
16:45	Technical and Economic Performance of Best Practice SHC Plants – A Compilation of IEA SHC Task 53 Results *Daniel Neyer, daniel neyer brainworks*

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17:00 - 18:30	**ESTTP Workshop**

ESTTP Workshop

Day: Wednesday, September 12
Time: 17:00 - 18:30
Room: 5.002

Presentations and discussions from this RHC/ESTTP/Solar Heat Europe Workshop will focus on the ESTTP platform (European Solar Thermal Technology Platform) and its future and on the results of the recent RHC (Renewable Heating & Cooling) tender on R&D/innovation and organization of the solar thermal market in Europe.

17:00	**Happy Hour**
18:30	**Conference Dinner** *Please see page 37 for more information.*

Thursday, September 13, 2018

08:30 - 09:30	**Keynote Lectures**
	AULA
	Chair: Daniel Mugnier, TECSOL
08:30	Perspectives of Large Scale Solar Process Heat
	Klaus Vajen, University of Kassel
08:55	Solar Energy + Heatpumps
	Michel Haller, SPF Institute for Solar Technology

Klaus Vajen

Klaus Vajen holds a PhD in applied physics and is director of the Institute of Thermal Energy Engineering at University of Kassel (DE). His scientific work focuses mainly on experimental and numerical investigations of (solar) thermal energy components and systems, where he published more than 300 scientific papers.
He founded and coordinates the master programme „Renewable Energies and Energy Efficiency (re2)“ at Kassel University as well as the European graduate school for PhD-students „Solar Energy Network (SolNet)“. He is member of the ISES board of directors and was the chair of the Solar World Congress 2011 in Kassel.

Michel Haller

Michel Haller holds a Master degree in Environmental Sciences of ETH Zürich and a PhD from Graz University of Technology. He is Head of Research at the SPF Institute for Solar Technology at University of Applied Sciences Rapperswil HSR since 2015, supervising different research topics of solar energy at the institute. His personal expertise are solar thermal and PV combinations with heat pumps, exergetic performance of thermal energy storage, seasonal storage of energy, hardware-in-the-loop testing of building energy supply systems and system simulations. He has also been a Board member of the Cross Cutting Panel of the European Technology and Innovation Platform for Renewable Heating and Cooling from 2015 to 2018.

09:30 - 10:15	**Session 1-A: Solar Resource and Energy Meteorology**
	ROOM 3.011
	Chair: Christof Biba, HSR
09:30	Ensemble Detrending for Solar Nowcasting
	Luis Martin Pomares, Hamad Bin Khalifa University
09:45	ViSoN: Developing a Low-Cost Solar Irradiance Nowcasting System
	Manuel I. Peña-Cruz, CONACYT - Centro de Investigaciones en Optica, A.C. - Unidad Aguacalientes

09:30 - 10:15	**Session 1-B: Solar Thermal Collectors and Solar Loop Components**
	ROOM 3.010
	Chair: Maria Joao Carvalho, LNEG
09:30	Tracking Concentrator for Fixed Tilt Flat Plate Collectors
	Jose Ignacio Ajona, Seenso Renoval
09:45	Design of a Small Size PTC for Residential Application: Computational Model for the Receiver Tube and Validation with Heat Loss Test
	Michele Salvestroni, Università degli Studi di Firenze
10:00	Testing and Modeling of Direct Steam Generation Parabolic Trough Collectors
	Souha Ferchichi, Ecole Nationale d' Ingénieurs de Tunis (ENIT),Université de Tunis El Manar (UTM)

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09:30 - 10:15	**Session 1-C: Domestic Hot Water and Space Heating**
	ROOM 3.008
	Chair: Harald Drück, IGTE - University of Stuttgart
09:30	Artificial Intelligence for the Efficient Control of Solar Heating Systems
	Wolfgang Kramer, Fraunhofer ISE
	Presented by Sebastian Herkel, Fraunhofer ISE
09:45	Towards Automated Continuous Performance Benchmarking of DHW and Combi Systems
	Christoph Schmelzer, University of Kassel
10:00	Hardware-in-the-Loop Tests on Complete Systems with Heat Pumps and PV for the Supply of Heat and Electricity
	Robert Haberl, SPF Institute for Solar Technology

09:30 - 10:10	**SAC-4: Industry Forum: Recent Development and Implementation**
	AULA
	Chair: Wolfgang Streicher, University of Innsbruck
09:30	Breakthrough in (Waste) Heat Driven Cooling Technology to Compete with Vapor Compression Systems
	Henk de Beijer, SolabCool B.V.
09:40	Solar Cooling - Measurement Results and Operating Experience of Large-Scale Solar Air Conditioning Plants
	Lukas Feierl, SOLID Gesellschaft für Solarinstallation und Design mbH
	Presented by Hannes Poier, SOLID Gesellschaft für Solarinstallation und Design mbH
09:50	Monitoring and Energy Performance Assessment of the Compact DEC HVAC System “Freescoo Facade” in Lampedusa (Italy)
	Marco Beccali, Università degli Studi di Palermo (DEIM)
10:00	Development of a Photovoltaic Driven Thermodynamic Chiller – Application to Solar Air Conditioning and Cooling Storage
	Philippe Esparcieux, ATISYS CONCEPT

10:15 - 10:45	**Coffee Break**

10:45 - 12:15	**Session 2-A: Renewable Energy Strategies and Policies**
	ROOM 3.011
	Chair: Tim Selke, AIT
10:45	Research for Compiling a Mandatory National Standard „Technical Code for Energy Efficiency in Buildings and Renewable Energy Application“
	Ruicheng Zheng, China Academy of Building Research
11:00	New Swiss Regulations for Self-Consumption Communities
	David Stickelberger, Swissolar
11:15	Indoor Climate Agreements in Energy-Efficiency and Renovation Projects - A Question of Justice?
	Annette Henning, School of Technology and Business Studies, Dalarna University

11:30	The Solar Financial GAP Index, Quantifying Investment Per Global Hectare, the Road to 2030 and 2050 CO_2 Reduction Goals *Ignacio Smith, SM Solar*
11:45	Solar PV Communities Through Local Self Governments – A Case Study from the Indian State of Kerala *Ajith Gopi, ANERT*
12:00	A Novel Approach for Using Solar to Drive Desalination to Achieve Low-Cost, Large-Scale Water Generation *Andrew Skumanich, SolarVision Co*

10:45 - 12:15 Session 2-B: Solar Thermal Collectors and Solar Loop Components

ROOM 3.010
Chair: Maria João Carvalho, LNEG

10:45	Radiative Collector and Emitter: Experimental Results *Sergi Vall, Universitat de Lleida*
11:00	Surface Modification of AISI 316 Stainless Steel by Oxynitrocarburizing for Solar Collector Applications *Gregorio Vargas, CINVESTAV-Saltillo*
11:15	Accelerated Aging Tests for Solar Absorber Coatings *Teresa Diamantino, LNEG*
11:30	Assessment of Durability of Solar Absorbers - Performance Criterion *Maria João Carvalho, LNEG*
11:45	Experimental Investigation of Two Types of Solar Thermal Systems Connected in Series Integrated with Seasonal Thermal Energy Storage *Min-Hwi Kim, Korea Institute of Energy Research*
12:00	Annual Efficiency - Easy Understanding of Collector Performance *Stefan Abrecht, Solar-Experience GmbH*

10:45 - 12:15 Session 2-C: Solar Assisted District Heating and Cooling

ROOM 3.008
Chair: Jan Erik Nielsen, SolarKey Int.

10:45	Experimental Plant for Analyzing the Technical Feasibility of Decentralized Solar Heat Feed-In *Kai Schäfer, Solites*
11:00	Distributed vs Centralized Solar District Systems. Study Case in Balearic Islands Districts *Andreu Moià-Pol, Universitat de les Illes Balears*
11:15	Energetic and Economic Analysis of a Solar-Assisted Trigeneration System *Matteo D'Antoni, Eurac Research*
11:30	Thermo-Chemical District Networks *Claudio Koller, ZHAW Zurich University of Applied Science*
11:45	Upgrading the Largest Solar District Heating System with Seasonal Thermal Energy Storage in Crailsheim, Germany *Natalie Gohl, ITW/TZS, University of Stuttgart* *Presented by Harald Drück, ITW/TZS, University of Stuttgart*

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12:00	Comparison of Solar District Heating Concepts at Various Land Prices *Isabelle Best, University of Kassel* *Presented by Klaus Vajen, University of Kassel*

10:45 - 12:15 SAC-5: Performance and System Design

AULA
Chair: Daniel Mugnier, TECSOL

10:45	Levelised Cost of Thermal Energy Storage and Battery Storage to Store Solar PV Energy for Cooling Purpose *Christoph Luerssen, Solar Energy Research Institue of Singapore (SERIS)*
11:00	Life Cycle Assessment Experiences for Solar Heating and Cooling Systems *Marco Beccali, Università degli Studi di Palermo (DEIM)*
11:15	Experimentally Validated Dynamic Model for a Solid Adsorption System for Solar Heating and Cooling Applications *Valeria Palomba, CNR ITAE*
11:30	Influence of Control and Management Strategies on the Overall Efficiency of a Solar Refrigeration System *Gioacchino Morosinotto, Free University of Bozen*
11:45	Simulations of Solar Thermal Cooling System for a Building at Innovation Park Muscat *Tom Cordes, HTW Berlin, University of Applied Sciences, Department of Renewable Energy Systems*
12:00	Simulation of a Solar Fired Absorption System for a Case Study in the Dairy Industry *Camila Correa-Jullian, Universidad de Chile*

12:20 - 13:15 Closing Session

AULA

Conference Wrap Up: Building Technology
Sebastian Herkel, Fraunhofer ISE

Conference Wrap Up: Solar Technology
Klaus Vajen, University of Kassel

Poster Awards
Wolfgang Streicher, President ISES Europe
Andreas Witzig, Zurich University of Applied Sciences
Christian Schweigler, Munich University of Applied Sciences

Closing Remarks and Announcement of EuroSun 2020
Wolfgang Streicher, President ISES Europe

Closing Remarks and Announcement of the ISES Solar World Congress 2019
Dave Renné, President ISES

Farewell
Andreas Häberle, SPF Institute for Solar Technology

13:15 - 14:00 Lunch Break

14:00	Technical Tours *Please see page 37 for more information.*

Side Events - Thursday, September 13

Polysun Workshops

The Polysun workshops will be held in German and English.
Please find detailed information on the conference website. Register for the workshops at info@velasolaris.com.

Polysun Workshop 1:
Time: 08:30 - 12:15
Speaker: Luc Meier (Vela Solaris AG)
Room: 8.U44a

Polysun Workshop 2:
Time: 08:30 - 12:15
Speaker: Lars Kunath (Vela Solaris AG)
Room: 8.U44b

Polysun Workshop 3:
Time: 13:30 - 17:00
Speaker: Prof. Dr. Ralf Eismann (FHNW)
Room: 8.U44a

Polysun Workshop 4:
Time: 13:30 - 17:00
Speaker: Marc Jakobi (Vela Solaris AG)
Room: 8.U44b

Price Reduction of Solar Thermal Systems – Results of IEA SHC Task 54

Time: 14:30 - 16:00
Room: 5.002

Workshop description: The greatest challenges of the 21st century to secure a sustainable energy supply and to considerably reduce CO_2 emissions cannot be reached without the significant growth of solar thermal markets worldwide. However, having the image of being too expensive to buy, too complex to install, too costly to maintain, solar thermal often loses the race against other offerings in today's heating sector. How this trend can be reversed is one of the key questions of the SHC's Task 54 „Price reduction of solar thermal systems", which will be finished in October 2018. The final presentation of the results at EuroSun 2018 will give information on the solar thermal value chain and highlight parts with the highest cost reduction potential. Task 54 experts explain economic and technological mechanisms that could change the price structure of current solar thermal systems decisively by help of practical examples.

Program:

- Introduction to the IEA SHC Task 54 „Price reduction of solar thermal systems"
  Dr. Michael Köhl, Fraunhofer ISE
- Calculating the system-based thermal energy costs (STEC) for reference solar thermal systems
  Yoann Louvet, Kassel University
- Improvements developed during the IEA SHC Task 54
  – New materials
    Dr. Michael Köhl, Fraunhofer ISE
  – Technical improvements
    Dr. Federico Giovannetti, ISFH
  – Non-technical improvements and learning curve issues (economic issues, marketing, etc.)
    Dr. Daniel Mugnier, TECSOL
- Impact of the improvements developed during IEA SHC Task 54 on the system-based thermal energy costs (STEC)
  Dr. Stephan Fischer, ITW

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Young ISES Get-Together

We invite all students and young professionals to join the „Young ISES get-together". The informal event will take place at the Restaurant Rossini. Participants can enjoy a drink and a pizza or pasta for a special rate of CHF 20.

Date: Tuesday, September 11

Time: from 18:30

Location: Restaurant Rossini
Rathausstrasse 2
8640 Rapperswil

Please sign-up at the registration desk by Tuesday, 11 September, 12:30.

Conference Dinner

The EuroSun 2018 Conference Dinner will take place at the restaurant „Bächlihof" in Jona. The „Bächlihof" is a rustic-modern event location at a traditional Swiss farm. Enjoy a pleasant evening in a convivial and relaxed atmosphere with colleagues and friends!

Date: Wednesday, September 12

Time: from 18:30

Fee: CHF 100 (pre-registration is required)

Location: BÄCHLIHOF
Jucker Farm AG
Blaubrunnenstrasse 70
CH-8645 Jona

A bus shuttle from HSR to the „Bächlihof" will be provided at 18:15 and at 18:30, but you may also enjoy a beautiful half hour walk (from HSR) along the shore of Lake Zürich.

The restaurant is also easily accessible by bus (Bus 991/992 until Grünfeld) or by car (parking for a fee at the sports facilities Grünfeld).

Between 22:00 and 24:00, the bus shuttle will bring you back from Bächlihof to HSR every 15 or 20 minutes.

Please note: the latest departure of trains from Rapperswil to different directions (back to your hotel) is between i.e. 22:33 (to Uznach) and 00:10 (to Zürich). Please check carefully the timetable for your train at: **www.zvv.ch** or **www.sbb.ch**.

Technical and Sightseeing Tours

Date: Thursday, September 13

HSR Labs „walk-in"

Visit various labs of SPF, the Institute for Solar Technology as well as the Power-to-Methane Demonstration Plant of IET, the Institute for Energy Technology.

Start: The different locations in building 2 are staffed from 14:00 onwards

Return: The labs close at 17:00

Fee: free of charge *(pre-registration required during conference registration)*

EMPA Labs

Visit EMPA R&D laboratories such as NEST (Next Evolution in Sustainable Building Technologies) or MOVE (the future mobility demonstrator).

Start: 14:00 at the main entrance of building 1 (bus to EMPA leaves on time at 14:10)

Return: Tour ends at 16:30 at EMPA (Dübendorf), bus back to Rapperswil departs at 16:45 (optional: you may also travel directly to the airport from Dübendorf with suburban train)

Fee: CHF 20 *(pre-registration required during conference registration - the number of participants is limited)*

Rapperswil City Tour

Take a guided walk through the picturesque old town of Rapperswil and enjoy an afternoon exploring the city and learning about its history.

Start: 14:00 at the main entrance of building 4

Return: 16:00 at HSR

Fee: CHF 10 *(pre-registration required during conference registration - the number of participants is limited)*

General Information

Registration

Each participant has to register in person at the registration desk to collect a conference bag and name badge before attending any sessions. Please make sure to wear your badge for admission to all sessions and side events. Participants who have lost their badge should report to the registration desk.

Registration times are during conference hours, starting at 08:00.

Posters

Please mount your poster before the start of the poster session. Do not remove your poster until the end of the conference. Posters are an important part of the scientific program and should be displayed the whole time.

Please remove your poster before you leave. Remaining posters will be discarded.

Short Poster Videos

All poster authors have the opportunity to present their poster in a short video. Please come to the video station in the foyer of building 1 on Tuesday, September 11 between 09:00 and 17:00 with your research poster. There you can present the most important points of your research on a video set. The one to two-minute video is filmed and will be published open access on the ISES Youtube channel.

Speaker Information

All presentations must be handed in at the Media Upload Desk one hour before your session. You will not be able to display your presentation directly from your laptop computer or USB flash drive. Our technical support team will welcome you at the Media Upload Desk (close to the Registration Desk) during all conference days, starting at 08:00.

Please meet your session chair inside the conference room at least 10 minutes prior to the beginning of your oral session to acquaint yourself with the technical equipment.

Certificate of Attendance

A certificate of attendance for participants will only be available on-site at the Registration Desk and cannot be issued after the conference.

Conference Proceedings

The proceedings will be published open access in the online ISES proceedings database after the conference, covering papers with sufficient scientific quality. This collaboration will provide optimum visibility of the proceedings and ensures that the authors‘ publications remain traceable and citable. Final online papers will contain individual DOI numbers for each paper.

List of Participants

Registered participants may download a list of participants on the conference website, www.eurosun2018.org. The login and password sent to you during registration will be required to gain access to the download area.

Contact Participants

EuroSun offers a contact opportunity for conference participants in its internal Download Area. Login with your password and contact other participants by e-mail.
All participants who want to use the contact feature can confirm their admission to receive e-mails from other conference participants in the Download Area. The first contact will occur indirectly via the conference system in the Download Area. No personal data will be handed out.

WiFi Access

WiFi access is available free of charge at HSR. To use the WiFi please choose the SSID „HSR WLAN“. You will be asked to enter your mobile number and a voucher code which is „eurosun2018“. You will then receive your individual access code by text message (SMS) on your mobile.

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